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In Re Application of:

Jeffrey A. Seder | Confirmation No.: 4504

Application No.: 10/521,087 | Group Art Unit: 3643

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For: ECHOCARDIOGRAPHIC MEASUREMENTS AS PREDICTORS OF RACING SUCCESS

Commissioner for Patents
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DECLARATION UNDER 37 C.F.R. § 1.56 OF JEFFREY A. SEDER

1. I am the named inventor of U.S. Application Number 10/521,087.

2. Since 1983, one of my employees and I have been obtaining select two-dimensional echocardiographic measurements from over 30,000 unraced Thoroughbred racehorse prospects to provide descriptive echocardiographic data for normal horses grouped by age, sex, and body size. In addition, we have been compiling data on the subsequent racing careers of the same horses, to investigate the relationship of the echocardiographic measurements to subsequent racing performance. My object was to identify any key echocardiographic variables that can be used as predictive indices of subsequent racing performance.

3. Cardiac measurements vary depending on age, sex, and weight, making it extremely difficult to compare horses on the basis of cardiac measurements without simultaneously adjusting for the effects of these parameters. I used two statistical techniques, percentiles and standardized scores, in order to eliminate the effects of age, sex, and weight. These statistical techniques were only possible because of the large number of horses studied.

4. Percentiles and standardized scores for the echocardiographic measurements of left ventricular cross sectional area in diastole (LVD), left ventricular cross sectional area

in systole (LVS), interventricular septal wall structural thickness in diastole (SW), splenic cross sectional area (SPLN), and percent stroke volume (PS) were calculated by comparing the subject horse to others that were the same sex as the subject horse, measured within 30 days of chronologic age of the subject horse, measured within one year of when the subject horse was measured, and within 25 lbs of weight of the subject horse. Percentiles and standardized scores for weight, height and HTWT (the product of height x weight) were also calculated.

5. Stepwise analysis was used to identify statistically significant variables that could differentiate between groups of horses categorized as high and low earners.

6. Discriminant analysis was used to classify high earners versus low earners, and high earner routers versus high earner sprinters.

7. Once the key variables of HTWT, LVD, LVS, PS, SPLN, and SW were standardized for age, sex, and weight, on a scale from 0 to 100, groups of horses were created on the basis of these variables.

8. The results demonstrated that a horse's weight and height were important predictive indices of subsequent performance, in terms of earning and successful distances raced. In addition, SW, was found to be an important predictive variable when differentiating between high and low earners. Additionally, SW or SPLN were the most important predictive variable when differentiating between high and low earners. In addition to physical size, LVD and LVS were the most important predictive variables when differentiating between successful sprinters and routers.

9. Several of the variables studied were highly correlated. Discriminant models typically had very similar results when one or two variables were replaced with other variables with which they were highly correlated (*e.g.,* LVS and LVD or WT and HTWT).

10. Blind tests showed that cardiac parameters predicted subsequent racing performance with far greater accuracy than selection of horses from these groups at random. Models successfully differentiated not only between stakes and claiming caliber-horses, but also between stakes-and allowance-caliber horses.

11. On average, blind test discriminant models improved random odds of identifying high earners (or routers) by 35% (*i.e.*, going from a 30% probability of correctly identifying high earners without models to a 40% probability with models).

12. The echocardiographic data we compiled was obtained in a commercial setting, as there was no other feasible way to obtain access to this large number of racing prospects to perform the echocardiographic examinations. In particular, we have been obtaining echocardiographic data on racing prospects at prominent U.S. yearling and two year old in training sales using a variety of scanning equipment and scan methodologies since 1983. In addition, we have, for a fee, been providing our opinions and recommending horses for purchase on the basis, in part, of echocardiographic data, together with various other considerations (including pedigree, conformation, physical examination, gait analysis, etc.). It was not, however, until after we had amassed the data reported in the instant application from the a group of 7000+ horses using the most recent generation of scan equipment and identical methodology, together with data relating to their subsequent racing careers, and performed the aforementioned statistical analyses on this data, that we identified the claimed combinations of variables that can be used as predictors of racing success. Thus, the invention that is the subject of this application was neither complete, nor ready for patenting until these statistical analyses were completed, which was shortly (less than 1 year) before our application for patent was filed.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 3/6/06

Jeffrey A. Seder